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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/065,759	11/15/2002	Kenneth Lewis Blanchard	020692/KEL93	9196
32583	7590	11/22/2005	EXAMINER	
KELLOGG BROWN & ROOT, INC. 601 JEFFERSON AVENUE HOUSTON, TX 77002			NECKEL, ALEXA DOROSHENK	
			ART UNIT	PAPER NUMBER

1764

DATE MAILED: 11/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/065,759

Applicant(s)

BLANCHARD, KENNETH LEWIS

Examiner

Alexa D. Neckel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) ____ is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 November 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11-15-02.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "200" in figure 2 has been used to designate both "catalyst zone" and what appears to be "bottom panel 134". Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: outlet pipe 322 (paragraph 0029). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the

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applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 6, 7 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Notman (4,311,671).

With respect to claims 6 and 16, Notman discloses an apparatus comprising:

an upright cylindrical shell (11);

at least one fixed bed catalyst zone (12B' and 12B'') (wherein the catalyst zone is filled with catalyst) disposed within the shell between an upper gas inlet zone (28A) and a lower gas outlet zone (not numbered, figure 5) configured for parallel downward gas flow split between the beds (col. 9, lines 4-28);

cartridge/annular housing (10) forming an outer shroud and a tube (26) forming an inner shroud around a tube and shell heat exchanger (40);

a partition plate (22B') in the annular housing (10) disposed between the upper (12B') and lower (12B'') catalyst volumes;

an upper discharge plenum formed between the partition plate (22B') and a catalyst support (16B') below the upper catalyst volume (12B');

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an intermediate plenum formed between the partition plate (22B') and the lower catalyst volume (12B", the top of which is the dashed line);

a gas bypass (52) to divert flow past the upper catalyst volume (12B') to the intermediate plenum above the lower catalyst volume (12B");

a lower discharge plenum below a catalyst support (16B") for the lower catalyst volume (12B");

a passage (53) in communication between the upper and lower discharge plenums; and

shell-side inlets (34, 30, 28A) and an outlet (not numbered) for fluid into and out of the heat exchanger and wherein the outlet is in fluid communication with the gas outlet zone (lower portion not numbered, figure 5).

With respect to claim 7, Notman further discloses wherein pluralities of conduits (52, 36, 53) pass through the catalyst beds to effect the parallel flow gas split.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Notman (4,311,671) in view of LeBlanc et al. (5,736,116).

With respect to claim 1, Notman discloses a reactor comprising:

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a vessel with an upright cylindrical shell (11);

a plurality of fixed catalyst bed zones spaces apart in the vessel (11) with uppermost (12A), intermediate (12B' and 12B'') and lowermost (14' and 14'') catalyst bed zones;

wherein the uppermost (12A) and intermediate (12B' and 12B'') zones are concentrically disposed about a shell and tube heat exchanger (14/26); and

wherein the intermediate catalyst zone (12B' and 12B'') comprise two mechanically separated catalyst beds (12B' and 12B'') disposed vertically with respect to each other (see figure 5) and configured for parallel downward gas flow split between the beds (col. 9, lines 4-28).

While Notman teaches that the device can be used for ammonia synthesis, fails to disclose specific catalysts for the beds.

LeBlanc et al. also discloses an ammonia production plant and teaches wherein having a high activity catalyst downstream of magnetite increase ammonia conversion and upgrades the overall performance of the system (col. 8, lines 55-65). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a magnetite catalyst in the uppermost catalyst bed zone and a high activity catalyst in the intermediate and lowermost catalyst bed zones of Notman in order to achieve increased ammonia conversion as taught by LeBlanc et al.

With respect to claim 2, Notman further discloses wherein the lowermost catalyst zone (14' and 14'') comprises two mechanically separated catalyst beds disposed

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vertically with respect to each other (see figure 5) and configured for parallel downward gas flow split between the beds (col. 9, lines 29-39).

With respect to claim 3, it can be seen in figure 5 of Notman that shell (11) has a substantially uniform diameter along the length of the catalyst zones (12A, 12B' & 12B" and 14' & 14").

With respect to claim 4, Notman further discloses wherein pluralities of conduits (52, 36, 53) pass through the catalyst beds to effect the parallel flow gas split.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Notman (4,311,671) in view of LeBlanc et al. (5,736,116) as applied to claim 1 above, and further in view of Topsoe et al. (4,181,701).

With respect to claim 5, Notman discloses flow/by-pass passages which are disposed within the catalyst bed and fails to disclose wherein these passages can be located annularly around each catalyst bed.

Topsoe et al. also teaches an apparatus for synthesis of ammonia and discloses wherein providing passages around a catalyst bed/by-pass in an annular space achieves advantages with regard to the passage's relationship to the centrally disposed heat exchanger as well as allowing for a catalyst bed to be entirely removed from the device for replacement (col. 3, lines 55- col. 4, line 31). It would have been obvious to one of ordinary skill in the art at the time the invention was made to re-locate the passages of Notman to be annularly disposed about the catalyst beds in order to

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achieve the heat exchange temperature control as well as making replacing catalyst easier as taught by Topsoe et al.

8. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Notman (4,311,671).

With respect to claims 8 and 9, though Notman illustrates of only a single gas bypass (52) to divert flow past the upper catalyst volume (12B') to the intermediate plenum above the lower catalyst volume (12B'') and a single a passage (53) in communication between the upper and lower discharge plenums (as discussed with respect to claim 7, above), it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide multiple disclosed passages in order to allow for more material to be diverted in the desired manner. It has been held that the duplication of parts for a multiplied effect is not the type of innovation for which a patent monopoly is to be granted. *St. Regis Paper Co. v. Bemis Col, Inc.*, 193 USPQ 8, 11 (7th Circ. 1977).

9. Claims 10-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Notman (4,311,671) as applied to claims 6 and 8 above, and further in view of Topsoe et al. (4,181,701).

With respect to claims 10 and 11, Notman discloses flow/by-pass passages which are disposed within the catalyst bed and fails to disclose wherein these passages can be located annularly around each catalyst bed.

Topsoe et al. also teaches an apparatus for synthesis of ammonia and discloses wherein providing passages around a catalyst bed/by-pass in an annular space achieves advantages with regard to the passage's relationship to the centrally disposed heat exchanger as well as allowing for a catalyst bed to be entirely removed from the device for replacement (col. 3, lines 55- col. 4, line 31). It would have been obvious to one of ordinary skill in the art at the time the invention was made to re-locate the passages of Notman to be annularly disposed about the catalyst beds in order to achieve the heat exchange temperature control as well as making replacing catalyst easier as taught by Topsoe et al.

With respect to claim 12, Notman teaches of an inverted conically shaped support (24) for securing structural elements together within the device (col. 7, line 60 – col. 8, line 14) but fails to specifically disclose wherein they can be included between the shell (11) and outer shroud/cartridge (10). It would have been obvious to one of ordinary skill in the art at the time the invention was made to locate the support means (24) taught by Notman in various locations throughout the device, including between in order to ensure the shell (11) and outer shroud/cartridge (10) maintain their relative positions during operation of the device.

With respect to claims 13 and 14, Notman discloses wherein the discharge passages is disposed within the catalyst bed and fails to disclose wherein this passage can be located annularly around each catalyst bed.

Topsoe et al. also teaches an apparatus for synthesis of ammonia and discloses wherein providing passages around a catalyst bed/by-pass in an annular space

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achieves advantages with regard to the passage's relationship to the centrally disposed heat exchanger as well as allowing for a catalyst bed to be entirely removed from the device for replacement (col. 3, lines 55- col. 4, line 31). It would have been obvious to one of ordinary skill in the art at the time the invention was made to re-locate the passages of Notman to be annularly disposed about the catalyst beds, along with the necessary openings, in order to achieve the heat exchange temperature control as well as making replacing catalyst easier as taught by Topsoe et al.

With respect to claim 15, the modification of Notman in view of Topsoe et al. teaches wherein the fixed bed zones can be of a modular design that can be easily removed and replaced within the system (col. 3, lines 55- col. 4, line 31).

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexa D. Neckel whose telephone number is 571-272-1446. The examiner can normally be reached on Monday - Thursday from 9:00 AM - 7:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Alexa D. Neckel
Examiner
Art Unit 1764

November 17, 2005

Alexa D. Neckel
ALEXA DOROSHENK NECKEL
PRIMARY EXAMINER